REMARKS

In the Office Action, claims 1-42 were rejected. By the present Response, claims 3, 9-11, 15-17, 22-24, 27-30, 38, and 41-42 are amended for clarification of certain features. Upon entry of the amendments, claims 1-42 will remain pending in the present patent application. Reconsideration and allowance of all pending claims are requested.

Examiner's Claim Interpretation

On a preliminary note, Applicants point out that the Examiner improperly defined a claim term in the Office Action. Specifically, "the Examiner defines a data-based methodology as a methodology which requires the use of a pre-acquisition image (such as a navigator image as disclosed)." Office Action, page 3. Applicants respectfully remind the Examiner that M.P.E.P. § 2111 states that "[d]uring patent examination, the pending claims must be given there [*sic*] *broadest reasonable interpretation* consistent with the specification." (emphasis added). The Examiner's definition of "a data-based methodology" is clearly not supported by the present application. In particular, by requiring that the data-based methodology use a *pre-acquisition* image, the Examiner has improperly read an *embodiment* described in the application into the present claims. Use of a pre-acquisition image is described in the present application as an exemplary data-based methodology. *See* Application, pages 10-11. However, data-based methodologies are not limited to use of pre-acquisition images. For example, data-based techniques are described as those "which rely on the imager 12." Application, page 6. In addition, another exemplary data-based methodology "may derive motion data from the *acquisition* image data." Application, page 11 (emphasis added). Accordingly, the Examiner's limitation of a data-based methodology to one "which requires the use of a pre-acquisition image" is clearly erroneous.

Rejections Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1-4, 6-10, 14-17, 19-23, 27-30, and 32-42 under 35 U.S.C. § 102(b) as anticipated by Chassaing et al. (U.S. Patent No. 6,278,890). Applicants respectfully traverse this rejection.

Legal Precedent and Guidelines

Anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention "*in as complete detail as contained in the ... claim*" to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Claim Features of Independent Claims 1, 14, 27, and 38 Omitted from Cited Reference

Turning to the claims, the present independent claim 1 recites, *inter alia*, "acquiring a first set of *one-dimensional motion data for an organ* along a first axis by a first methodology; acquiring a second set of *one-dimensional motion data for the organ* along a second axis by a second methodology, *wherein the first axis and the second axis are perpendicular*; acquiring a third set of *one-dimensional motion data* for the organ along a third axis by a third methodology, *wherein the third axis is perpendicular to the first axis and the second axis*; deriving one or more concurrent motion vectors from each of the first, second, and third sets of one-dimensional motion data; and combining the one or more concurrent motion vectors to generate a set of *three-dimensional motion data for the organ.*" (Emphasis added). Independent claim 14 recites a computer program having routines for performing the acts recited in claim 1.

Similarly, independent claim 27 recites, *inter alia*, "an imager configured to generate a plurality of signals representative of one or more structures within a region of interest; [and] a sensor-based motion determination system configured to acquire one-dimensional motion data from one or more sensors ... wherein the imager, the sensor-based motion determination system,

or a combination of the imager and the sensor-based motion determination system is configured to acquire a first, a second, and a third set of *one-dimensional motion data for an organ along respective first, second, and third perpendicular axes*; and wherein at least one of the sensor-based motion determination system, the data processing circuitry, or the operator workstation are configured to derive one or more *concurrent motion vectors* from each of the first, second, and third sets of one-dimensional motion data and to combine the one or more concurrent motion vectors to generate a set of *three-dimensional motion data for the organ.*" (Emphasis added).

Independent claim 38 recites, *inter alia*, "an imager configured to generate a plurality of signals representative of one or more structures within a region of interest and to acquire at least one set of acquisition image data used to derive a first, a second, or a third set of *one-dimensional motion data for an organ along respective first, second, and third perpendicular axes* ... wherein at least one of the data processing circuitry or the operator workstation is configured to derive one or more concurrent *motion vectors* from each of the first, second, and third sets of one-dimensional motion data and to combine the one or more concurrent motion vectors to generate a set of *three-dimensional motion data for the organ.*" (Emphasis added).

<u>One-Dimensional Motion Data for an Organ</u>

The cited reference does not teach or disclose acquiring "one-dimensional *motion* data for an *organ*," as recited by independent claims 1, 14, 27, and 38 (emphasis added). On the contrary, the Chassaing reference teaches a method for detecting the *location* of a *stenosis*, or *area* of abnormal blood flow. *See* Abstract; col. 2, lines 13-15. As the Examiner will surely appreciate, determining the *location* of an object and measuring the *motion* of an object are completely separate and distinguishable notions. In the Office Action, the Examiner stated that "Chassaing et al. thoroughly disclose the acquisition of motion data from a plurality of sensors (Col 7 line 55-65)." Office Action, page 2. However, this passage actually states that "the *relative positions* of shear wave *sensors* are determined." Chassaing, col. 7, lines 58-59 (emphasis added). Nothing in the Chassaing reference relates to acquisition of *motion* data. In addition, the Chassaing method does not disclose acquisition of data for an *organ*, but rather a *stenosis*, or area

of abnormal blood flow. As the Examiner will appreciate, a stenosis is *not* an organ. Accordingly, any data acquired in the Chassaing method cannot be used "to generate a set of three-dimensional *motion data for the organ*," as recited by independent claims 1, 14, 27, and 38.

First, Second, and Third Perpendicular Axes

Furthermore, any data acquired in the Chassaing reference is not acquired along first, second, and third perpendicular axes, as recited by independent claims 1, 14, 27, and 38. Rather, the Chassaing reference discloses a single sensor array placed above a volume of a patient's body that may include a stenosis. *See* Chassaing, col. 18, lines 12-14; *see also* Fig. 5. Therefore, data acquisition occurs along *one* general direction, not three perpendicular axes.

In view of these deficiencies, among others, the cited reference cannot anticipate independent claims 1, 14, 27, and 38 and their dependent claims.

Evaluation of Means-Plus-Function Language in Claim 42

Applicants respectfully note that claim 42, which was rejected under 35 U.S.C. § 102(b) in view of the cited reference, includes means-plus-function language, as set forth in 35 U.S.C. § 112, paragraph 6, *and should be examined in accordance with this body of law*. As may be appreciated, with respect to 35 U.S.C. § 112, paragraph 6, an Examiner "may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination." *In re Donaldson Co.*, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994); *see also* Manual of Patent Examining Procedure §§ 2181-2186.

Applicants respectfully note that the present rejection does not comport with the controlling case law or M.P.E.P. sections and is, therefore, deficient. Accordingly, the Examiner failed to establish a *prima facie* case of unpatentability in accordance with the relevant statutory and precedential authority outlined above. Applicants respectfully submit that independent claim 42 is patentable over the cited reference.

Claim Features of Dependent Claims Omitted from Cited Reference

The present dependent claims are believed to be allowable based on their dependencies from allowable independent claims 1, 14, 27, and 38. Furthermore, the dependent claims are believed to be allowable based on their own subject matter which is not disclosed in the cited reference.

Validation Motion Data

For example, claims 3, 16, 28, and 41 recite validating the one-dimensional motion data "using one or more respective sets of validation motion data." The Examiner stated that Chassaing discloses "measuring motion along all axes of a three-dimensional coordinate system and validating data (Col 18 Line 10-67). Office Action, page 2. Contrary to the Examiner's assertion, nothing in Chassaing teaches validating motion data. Rather, the passage cited by the Examiner discloses a method for determining the location of the sensors in relation to the patient's body. *See* Chassaing, col. 18, lines 28-30. Accordingly, the cited reference cannot anticipate dependent claims 3, 16, 28, and 41.

Unreconstructed Acquisition Image Data

In addition, dependent claims 7, 20, 33, and 39 recite that at least one set of one-dimensional motion data is determined from *unreconstructed* acquisition image data. In the Office Action, the Examiner indicated that the present claims are anticipated by the Chassaing reference but did not indicate where the cited reference discloses determining motion data from *unreconstructed* acquisition image data. *See* Office Action, page 2. Contrary to the Examiner's conclusory statement, the Chassaing reference does not teach or disclose the use of *unreconstructed* acquisition image data for any purpose, much less to determine motion data. Applicants therefore respectfully submit that dependent claims 7, 20, 33, and 39 are patentable over the cited reference.

For at least these reasons, among others, the Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 102.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 1-42 under 35 U.S.C. § 103(a) as obvious over Chassaing in view of Hushek et al. (U.S. Patent No. 5,810,729). Applicants respectfully traverse this rejection.

References Fail to Teach or Suggest all Features of Independent Claims

On a preliminary note, Applicants stress that the present Office Action is improper for failing to identify recited claim elements which are not present in the primary reference. Specifically, a rejection under 35 U.S.C. § 103 should include:

> (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,
>
> (B) *the difference or differences in the claim over the applied reference(s)*,
>
> (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and
>
> (D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

MPEP § 706.02(j) (emphasis added). In the Office Action, the Examiner failed to point out any recited elements of the independent claims which were *not* present in the primary reference in accordance with subsection (B) recited above. Furthermore, the Examiner failed to identify which elements of the Hushek reference anticipate elements of the independent claims. Accordingly, Applicants respectfully request that the Examiner, in a future non-final Office Action, either withdraw the rejections under 35 U.S.C. § 103 or clarify the rejection and specifically cite elements of the Hushek reference which hypothetically correspond to the claimed subject matter.

Turning to the claims, as discussed above, the primary Chassaing reference fails to disclose numerous features recited in the independent claims 1, 14, 27, and 38, and the Examiner has not properly examined the means-plus-function language of independent claim 42. Nothing in the secondary Hushek reference obviates the deficiencies of the primary reference. The secondary reference discloses determination of limb orientation during a series of MRI scans. *See* Hushek, col. 1, lines 48-50. Husheck does not disclose acquisition of *motion data* along *first, second, and third perpendicular axes*. In contrast, the secondary reference discloses acquiring a series of magnetic resonance images of a joint and attaching information about the angle of the joint to each image. *See* Husheck, col. 1, lines 48-58. In view of these deficiencies, among others, the cited references, taken alone or in hypothetical combination, cannot render obvious the independent claims 1, 14, 27, and 38 and their dependent claims.

Furthermore, the Examiner's rejection of independent claim 42 is deficient for the same reasons noted above. Specifically, the Examiner failed to evaluate claim 42 in accordance with 35 U.S.C. § 112, paragraph 6.

References Fail to Teach or Suggest all Features of Dependent Claims

The present dependent claims are believed to be allowable based on their dependencies from allowable independent claims 1, 14, 27, and 38. Additionally, the dependent claims are believed to be allowable based on their own subject matter which is not disclosed in the cited references. For example, dependent claims 5, 18, and 31 recite "wherein the respective set of motion data is derived from a set of pre-acquisition image data." In the Office Action, the Examiner stated that Hushek "teaches the use of navigator pre-acquisition images and data in the reconstruction of MRI data for a moving body part (Col 4 Line 20-48)." Office Action, pages 3-4. The Hushek reference discloses acquisition of a series of magnetic resonance image data of a joint. *See* Hushek, col. 1, lines 50-52. In the Hushek reference, interleaved navigator data is used to measure the angle of a joint for each image acquired, not to derive motion data. *See* Hushek, col. 4, lines 16-20. Accordingly, motion data is not "derived from a set of pre-acquisition image data," as recited by the present claims.

For at least these reasons, among others, the Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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